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ACTIVITY. *Coluber constrictor* (daily pttns., met. rate, in wild) 8-14; *Norops chrysoplepis scypheus* = *Anolis nitens scypheus*, *Norops chrysoplepis planiceps* = *Anolis nitens nitens* (diel pttnt.) 56-68; *Crotalus lepidus* (alloc. of energy to act., diffs. btwn. popns.) 319-329; *Crotaphytus collaris* (mvmnt. around territ., age & gender diffs.) 336-347; *Varanus mertensi* (energy util. in act., semiaquat. lizard) 354-362; *Sistrurus miliarius barbouri* (little seas. var. in sub-tropics) 389-401; *Podarcis hispanica atrata* (cannibalism aff. juv. act. level) 991-994.

AGE. *Crystallaria asprella* (age & growth, max. age) 68-78; *Desmognathus quadramaculatus* (age-size class & territor.) 78-84; *Chrysomys picta* (size & age at sex. matur. compar. btwn. popns.) 114-130; *Alligator mississippiensis* (advanced age at sex. matur. in S. Everglades) 212-216; *Crotaphytus collaris* (male age-size class, territor. & mating success) 336-347; *Plethodon cinereus* (change in head shape with age, rel. to diet) 576-586; *Desmognathus quadramaculatus*, *monticola*, *ocoei*, *wrighti* (evol. diffs. in age at first repro. rel. to body size) 783-790; *Notophthalmus viridescens* (rel. to size, mean age diffs. btwn. popns.) 866-874; *Ambystoma californiense* (large ann. var. in age at metamorph.) 895-901; *Crocodylus johnstoni* (ontogen. changes in diet) 978-988.

BEHAVIOR. *Gramma loreto* (male nest care, mating) 1-8; *Desmognathus quadramaculatus* (territor. rel. to body size) 78-84; *Sparisoma rubripinne*, *Acanthurus (bahianus, coeruleus)*, *Scarus iserti* (spawning aggreg. sites used 12-28 yrs.) 189-192; *Cynoscion regalis* (drumming, ctshp. & spawning in captiv.) 195-199; *Gyrinophilus porphyriticus* (size-rel. interpopn. mating barriers) 199-203; *Psammodyrmus algerius* (long-term red. in home range w/ tail loss) 208-209; *Parablennius sanguinolentus parvicornis* (male injuries rel. to repro. seas.) 216-219; *Crotaphytus collaris* (territ., aggress. & mating success) 336-347; *Paracirrhites arcatus* (color morph freq. rel. to hab. depth, soc. beh.) 362-371; *Ambystoma (jeffersonianum, maculatum)* (larval microhab. change w/ presence of larger congener) 372-378; *Sistrurus miliarius barbouri* (defens. beh. rel. to body temp.) 389-401; *Crotalus viridis oreganus* (strike beh. w/ sens. depriv.) 419-428; *Hemitripterus villosus* (ctshp. & cop., unique type sperm transfer, egg-laying) 452-454; *Rana utricularia* (fright resp. of tdpis. to pred. chems.) 455-459; *Bufo (microscaphus × woodhousii)* (hermaphr. mating beh., wild individ.) 470-472; *Xiphias gladius*, *Makaira (nigricans, indica)*, *Tetrapturus audeax* (2 cases of swordfish piercing ships are really marlins) 472-475; *Hippocampus harid* (coral reef spawning aggregs.) 483-485; *Cottus bairdi* (physical params. of position holding) 488-493; *Latimeria chalumnae* (mvmts. of epicaudal fin) 606-615; *Hippocampus zosterae* (ctshp. beh.) 634-640;

Lepomis gibbosus (nest defense & pred. level) 649-656; *Lacerta lepida* (hypothesis of lizard defense beh. to bird pred.) 722-726; *Chromis nitida* (foraging schools beh. rel. to pred. & compet.) 726-729; *Hyla versicolor* (male mating success rel. to chorus attendance) 729-734; *Dascyllus albisella* (larval coral choice by olfact. cues) 735-739; *Branchios-tegus japonicus* (captive spawning beh.) 743-746; *Cordylus cordylus* (pherom. detect. & sex discrim.) 839-845; *Lepomis marginatus* (nest-guarding w/ & w/out preds.) 845-851; *Bufo woodhousii fowleri* (female choice of male calls) 970-977; *Haemulon flavolineatum* (anti-pred. mobbing in fish school) 989-991; *Gramma loreto* (reprod. aggregs., ctshp. beh., size of mating males, female choice, nesting) 1037-1043.

BIOGEOGRAPHY. *Tandanus tandanus* (evol. hypothesis for cryptic spp., rel. to biogeogr.) 526-534; *Anolis gundlachi* (lack of therm. acclim. rel. to biogeogr.) 535-542; *Xyrauchen texanus* (isol. popns. not diverg., biogeogr. hypothesis) 542-550; *Culaea inconstans* (mtDNA var. btwn. popns., biogeogr. pttnts.) 563-575; *Merluccius (productus, gayi, hubbsi)*, *Trachurus (s. symmetricus, s. murphyi, lathamii)*, *Scomber japonicus* (var. genet. diverg. btwn. rel. antitropical marine fishes, biogeogr. hypothesis) 586-598; *Phallostethus lehi* n. sp., *Phenacostethus smithi* (of phallostethids rel. to geol. orig. of Borneo, endemism) 703-712; *Alestes* (fossils) (histor. biogeogr. evid., European characids) 746-750; *Crotalinae* (30 spp., all genera) (phylogen. anal. suggests single invas. New World) 763-773; *Cypri-nella venusta* (phylogen. anal. of mtDNA lineages, discord. with subspp.) 773-783; *Lythrurus (ardens, fasciolaris, matutinus)* (supports subspp. elevation) 813-823; *Micropterus dolomieu* (mtDNA evid. of ancestry of introd. popns.) 995-998.

CALLS. *Cynoscion regalis* (drumming, ctshp. & spawning in captiv.) 195-199; *Bufo (fowleri, w. woodhousii, w. australis)* (freq., supports taxon.) 274-280; *Atelopus chiriquiensis*, *Hyla regilla* (freq. rel. to hearing, frogs w/ & w/out middle ear) 428-432; *Kalophrynus (p. pleurostigma, p. interlineatus = interlineatus)* (evid. of sp. status of subspp.) 440-445; *Bufo (microscaphus × woodhousii)* (by egg-laying wild hermaphr. individ.) 470-472; *Hyla (calypsa n. sp., lancasteri)* (descript.) 615-626; *Hyla versicolor* (male mating success rel. to chorus attendance) 729-734; *Eleutherodactylus iberia* n. sp. (of smallest tetrapod) 852-859; *Hylodes heyeri* n. sp. (descript., son., compar. to congeners) 965-969; *Bufo woodhousii fowleri* (female choice of male calls) 970-977.

CANNIBALISM. *Desmognathus quadramaculatus* (in territ. defense) 78-84; *Ambystoma (jeffersonianum, maculatum)* (larvae) 372-378; *Hynobius retardatus* (larv. density aff. larv. head size, rel. to cann.)

478–483; *Podarcis hispanica atrata* (high level in island subsp.) 991–994.

CHROMOSOMES, *Rana graeca* (kar., NOR positions) 223–226.

COLORATION, *Hybognathus amarus* 41–55; *Sternopygus xingu* n. sp. 85–102; *Eleutherodactylus douglasi* n. sp. 103–108; *Cyphocharax laticlavus* n. sp. 109–113; *Aethiomastacembelus robertsi* n. sp. 130–139; *Cynotilapia afra* × *Pseudotropheus zebra* (evid. of hybrid.) 203–208; *Paracirrhites arcatus* (color morph freq. rel. to hab. depth, soc. beh.) 362–371; *Aphanotorulus (ammophilus)* n. sp., 6 other spp.) (juv. & adult) 379–389; *Luperosaurus yasumai* n. sp., *serraticaudus* n. sp.) 433–439; *Hyla calypsa* n. sp. 615–626; *Hippocampus zosterae* (changes during ctshp. beh.) 634–640; *Micromyzon* n. gen. *akamai* n. sp. 641–648; *Magosternarchus* n. gen. (*raptor* n. sp., *duccis* n. sp.) 657–670; *Spherooides (lispius)* n. sp., *rosenblatti* n. sp.) (compar. to rels.) 677–684; *Phallotethus lehi* n. sp. 703–712; *Urosaurus ornatus* (physiol. color change in iridophores) 804–812; *Lythyrus (ardens, fasciolaris, matutinus)* (nuptial colors define spp.) 813–823; *Eleutherodactylus iberia* n. sp. 852–859; *Perulibatrachus hilburni* n. sp. 901–904; *Nannoptopoma* n. gen. (*spectabilis*, *sternopychum* n. sp.) 904–912; *Gymnotus bahianus* n. sp. (unusual in *Gymnotus*) 937–944; *Neoharriotta pumila* n. sp. 955–965; *Hylodes heyeri* n. sp. 965–969.

COMPETITION, *Desmognathus quadramaculatus* (spatial, size-rel.) 78–84; *Cynoscion regalis* (no agon. beh. btwn. drumming males) 195–199; *Psammotomus algivus* (red. compet. fitness w/ tail loss) 208–209; *Parablennius sanguinolentus parvicornis* (male injuries rel. to repro. seas.) 216–219; *Crotaphytus collaris* (territ., aggress. & mating success) 336–347; *Ambystoma (jeffersonianum, maculatum)* (btwn. larvae, w/in & btwn. spp.) 372–378; *Lythyrus (snelsoni, umbratilis)* (evid. for compet. exclusion in parapatric spp.) 493–497; *Chromis nitida* (foraging schools beh. rel. to pred. & compet.) 726–729; *Desmognathus (quadramaculatus, monticola, ocoee, wrighti)* (rel. to adapt. rad. body size & life hist.) 783–790; *Bufo woodhousii fowleri* (rel. to female choice of male calls) 970–977; *Emoia (cyanura, impar)* (causes hab. segreg. in cryptic spp.) 998–1005.

DENTITION, *Siren intermedia* (cranial ontog., unique paedomorph.) 29–41; *Mycteroperca microlepis* (tooth ultrastruct. & attachmnt., rel. to diet) 167–180; *Cynotilapia afra* × *Pseudotropheus zebra* (evid. of hybrid.) 203–208; *Aphanotorulus ammophilus* n. sp. (breeding males unique) 379–389; *Micromyzon* n. gen. *akamai* n. sp. (no lower jaw teeth) 641–648; *Alligator mississippiensis* (cause of toothlessness in wild) 739–743; *Alestes* (fossils) (lower Eocene characids, only teeth) 746–750; *Eleutherodactylus iberia* n. sp. (smallest tetrapod, reduc. dent.) 852–859; *Neoharriotta pumila* n. sp. (descript.) 955–965.

DEVELOPMENT, *Gramma loreto* (from fertil. to hatch.) 1–8; *Siren intermedia* (cranial ontog., unique

paedomorph.) 29–41; *Mycteroperca microlepis* (ontog. of diet & oral morph., larv. to juvs.) 167–180; *Alosa sapidissima* (embryon. neuromast unique config.) 226–228; *Plethodon cinereus* (head shape change, rel. to diet) 576–586; *Pseudacris (crucifer, triseriata)* (dev. rate rel. to pond-drying) 599–605; *Hyla calypsa* n. sp. (lab-reared tdpis.) 615–626; *Novumbra hubbsi* (egg to juv., no metamorph., system. charcs. for higher class.) 684–695; *Etheostoma caeruleum* (need stndrd. methods for egg dev. stages) 1005–1010.

DIGESTION, *Crocodylus johnstoni* (diff. dig. of prey types aff. stom. cont. anal.) 978–988.

DISTRIBUTION, *Gila cypha* (popn. estim., mvmts., rel. to dam) 15–28; *Hybognathus amarus* (range change) 41–55; *Norops chrysoplepis scyphus* = *Anolis nitens scyphus*, *Norops chrysoplepis planiceps* = *Anolis nitens nitens* (ecol. basis for dist. pttns.) 56–68; *Crystallaria asprella* (decreasing, needs undammed river) 68–78; *Sternopygus xingu* n. sp. 85–102; *Eleutherodactylus (douglasi)* n. sp., *delicatus, galdi* (disjunct dists. of sister spp.) 103–108; *Cyphocharax (laticlavus)* n. sp., *gouldingi* (incl. range exten. for *C. gouldingi*) 109–113; *Aethiomastacembelus robertsi* n. sp. 130–139; *Cnemidophorus (tigris dickersonae)* = *tigris disparilis*, *tigris gracilis* = *tigris punctilinealis* (type locals. change with reident. of types) 140–148; *Leptotyphlops macrops* n. sp. 162–166; *Cynotilapia afra* × *Pseudotropheus zebra* (intra-lake translocation leads to hybrid.) 203–208; *Bufo (fowleri, w. woodhousii, w. australis)* 274–280; Great Plains fishes (seas. change in spp., main & trib. stream compar., rel. to environ. var.) 280–289; *Aphanotorulus ammophilus* n. sp. 379–389; *Lasiognathus (beebei, waltoni, saccostoma, intermedius)* n. sp.) 401–409; *Kalophrynus (p. pleurostigma, p. interlineatus)* = *interlineatus* 440–445; *Lythyrus (snelsoni, umbratilis)* (ecol. factors in regional parapatria) 493–497; *Merluccius (productus, hubbsi)*, *Trachurus symmetricus*, *Scomber japonicus* (antitropical) 586–598; *Hyla (calypsa)* n. sp., *lancasteri* 615–626; *Micromyzon* n. gen. *akamai* n. sp. 641–648; *Magosternarchus* n. gen. (*raptor* n. sp., *duccis* n. sp.) 657–670; *Chaetostoma yurubienense* n. sp. 671–677; *Spherooides (lispius)* n. sp., *rosenblatti* n. sp.) 677–684; *Petrotilapia chrysos* n. sp. (confined to 2 islands, Lake Malawi) 695–702; *Phallotethus lehi* n. sp., *Phenacostethus smithi* (of 5 Bornean phallostethid spp., biogeogr. of fam.) 703–712; *Alestes* (fossils) (of all European characid fossils, lower Eocene) 746–750; *Lythyrus (ardens, fasciolaris, matutinus)* 813–823; *Nannoptopoma* n. gen. (*spectabilis*, *sternopychum* n. sp.) 904–912; *Cottus marginatus* 1012–1016.

ECOLOGY, *Coluber constrictor* (activ., met. rate, water flux compar. to rel. in dryer hab.) 8–14; *Norops chrysoplepis scyphus* = *Anolis nitens scyphus*, *Norops chrysoplepis planiceps* = *Anolis nitens nitens* (ecol. basis for distrib. pttns. rel. to forest changes in Quater.) 56–68; *Mycteroperca microlepis* (ontog. of feeding ecomorph.) 167–180; *Alligator mississippiensis* (eff. of low food & high temp. on body size)

- 212–216; Great Plains fishes (seas. change in spp., main & trib. stream compar., rel. to environ. var.) 280–289; *Crotalus lepidus* (ecol. of energy budget diffs. btwn. popns.) 319–329; *Lepomis macrochirus* (hab. specializ. w/in popn.) 348–354; *Varanus mertensi* (met. rate, water flux in semiaquat. lizard, seas. compar.) 354–362; *Ambystoma* (*jeffersonianum*, *maculatum*) (intraguild compet. btwn. larvae, microhab. changes) 372–378; *Lythrus* (*snellsoni*, *umbratilis*) (ecol. factors in parapatric distrib.) 493–497; *Plethodon cinereus* (feeding ecol. rel. to head shape) 576–586; *Pseudacris* (*crucifer*, *triseriata*) (tdpl. distrib. rel. to pond-drying, preds.) 599–605; *Lacerta lepida* (ecol. adapt. of lizards to bird pred.) 722–726; *Desmognathus* (*quadramaculatus*, *monticola*, *ocoe*, *wrighti*) (body size diffs. rel. to life hist. var. in multispp. assemb.) 783–790; freshwater fishes (223 spp.) (fish commun. pttns., Ecuadorian Amazon) 875–894; *Ambystoma californiense* (high ann. var. in reprod. ecol.) 895–901; *Crocodylus johnstoni* (hab. partit. rel. to ontogen. changes in diet) 978–988; *Emoia* (*cyanura*, *impar*) (hab. segreg. in cryptic spp.) 998–1005.
- EGGS**, *Gramma loreto* (describe, devel., loc. in nests) 1–8; *Crystallaria asprella* (size, seas.) 68–78; *Chrysomys picta* (clutch size rel. to mater. body size) 114–130; *Thelotornis capensis* (size, clutch mass) 290–299; *Hemipteris villosus* (egg-laying) 452–454; *Hyla calypsa* n. sp. (describe, spawning loc.) 615–626; *Novumbra hubbsi* (describe, spawning sites, egg dev., system. charcs. for higher class.) 684–695; *Branchiostegus japonicus* (mucous-envel. egg mass, captive spawning) 743–746; *Alytes* (*obstetricans*, *cisternasi*) (egg & tdpl. size rel. to pater. size) 824–831; *Etheostoma caeruleum* (need stndrd. methods to measure egg size & dev. stage) 1005–1010; *Cynolebias* (13 spp.) (surface of chorion sp. specific, phylogen. implics.) 1016–1022.
- ENDANGERED SPECIES**, *Gila cypha* (popn. estim., mvmts. rel. to hab. disturb.) 15–28; *Hybognathus amarus* (red. to 10% former range) 41–55; *Crystallaria asprella* (life hist., decreasing distrib.) 68–78; *Pseudemys rubriventris bangsi* (evid. against subsp. desig. for endangered subsp.) 192–195; *Scaphirhynchus suttkusi* (evid. for valid of sp., clad. anal. of fam., diagn. charcs.) 241–273; *Luperosaurus* (*yasumai* n. sp., *serraticaudus* n. sp.) (each sp. known from one spec., Borneo) 433–439; *Xyrauchen texanus* (isol. popns. not diverg., mtDNA data) 542–550; *Chaetostoma yurubienne* n. sp. (widespread hab. destruct.) 671–677; Ecuadorian freshwater fishes (223 spp.) (conserv. implics. of Amazon fish commun. pttns.) 875–894; *Ambystoma californiense* (reprod. ecol. of endgrd. sp.) 895–901; *Podarcis hispanica atrata* (high level cannibalism in endgrd. island subsp.) 991–994; *Cottus* (*marginatus*, *beldingi*) (best taxon. charcs. to ident. sympatric spp.) 1012–1016.
- EVOLUTION**, *Norops chrysolepis scypheus* = *Anolis nitens* *scypheus*, *Norops chrysolepis planiceps* = *Anolis nitens* *nitens* (ecol. rel. to vanishing refuge theory of speciation) 56–68; *Desmognathus quadramaculatus* (territor. data aff. theory of evol. of territorialism) 78–84; all Hawaiian freshwater fishes (5 spp.) (lack of different. btwn. islands) 330–335; *Paracirrhites arcatus* (color morph. evol. rel. to hab. & soc. beh.) 362–371; *Lacerta agilis* (select. advant. of female emerg. later than male) 462–464; *Tandanus tandanus* (evol. hypoth. for cryptic spp., rel. to biogeogr.) 526–534; *Merluccius* (*productus*, *gayi*, *hubbsi*), *Trachurus* (*s. symmetricus*, *s. murphyi*, *lathamii*), *Scomber japonicus* (origin & biogeogr. of rel. antitropical marine fishes, electroph. data) 586–598; *Crotalinae* (30 spp., all genera) (evol. rels. btwn. genera, rate of mtDNA evol.) 763–773; *Desmognathus* (*quadramaculatus*, *monticola*, *ocoe*, *wrighti*) (adapt. rad. body size & life hist. in multispp. assemb.) 783–790; *Lythrus* (*ardens*, *fasciolaris*, *matutinus*) (evol. spp. recognized) 813–823; *Alytes* (*obstetricans*, *cisternasi*) (tdpl. size rel. to pater. size, rel. to female mate choice) 824–831; *Ostraciidae* (reinterp. of evol. seq. of vert. fusions) 859–865.
- FECUNDITY**, *Chrysomys picta* (in anthropogen. nutrient-enhanced habs.) 114–130.
- FEEDING**, *Siren intermedia* (unique cranial paedomorph. rel. to burrow feeding) 29–41; *Mycterperca microlepis* (ontog. of diet & oral morph., larv. to juvs.) 167–180; *Crotalus viridis oreganus* (strike beh. w/ sens. depriv.) 419–428; *Plethodon cinereus* (rel. to head shape, dev. changes) 576–586; *Petrotalapia chrysos* n. sp. (notes) 695–702; *Chromis nitida* (foraging schools beh. rel. to pred. & compet.) 726–729.
- FEMORAL GLAND**, *Cordylus cordylus* (pheromone detect. & sex discrim.) 839–845.
- FOOD**, *Norops chrysolepis scypheus* = *Anolis nitens* *scypheus*, *Norops chrysolepis planiceps* = *Anolis nitens* *nitens* (stom. conts.) 56–68; *Chrysomys picta* (unusually carniv. diet aff. life hist.) 114–130; *Alligator mississippiensis* (low food & body size) 212–216; *Scaphirhynchus suttkusi* (stom. conts.) 241–273; *Thelotornis capensis* (arboreal snake takes 50% terrest. prey) 290–299; *Chelodina rugosa*, *Elseya dentata* (stom. conts., carniv. & herb. spp., wet & dry seas.) 409–419; *Crocodylus johnstoni* (ontogen. changes in diet, stom. conts.) 978–988.
- GENETICS**, *Pseudemys rubriventris* (low genet. divers., electroph. evid. against subsp. desig.) 192–195; all Hawaiian freshwater fishes (5 spp.) (evid. of gene flow btwn. islands, mtDNA data) 330–335; *Tandanus tandanus* (cryptic spp., detected by electroph., low heterozyg.) 526–534; *Xyrauchen texanus* (evid. of gene flow btwn. isol. popns., mtDNA data) 542–550; *Merluccius* (*productus*, *gayi*, *hubbsi*), *Trachurus* (*s. symmetricus*, *s. murphyi*, *lathamii*), *Scomber japonicus* (var. in gene flow btwn. rel. antitropical marine fishes, electroph. data) 586–598.
- GEOGRAPHIC LOCALITIES**, Alabama, *Scaphirhynchus suttkusi* 241–273; *Etheostoma* (*Nothonotus*) 300–318; *Cyprinella venusta* 773–783.

- Argentina, *Paralichthys* (patagonicus = *bicyclophorus*) 1035-1037.
- Arizona, *Gila cypha* 15-28; *Cnemidophorus* (*tigris* *gracilis* = *tigris punctilinealis*) 140-148; *Bufo* (*w. woodhousii*, *w. australis*) 274-280; *Bufo* (*microscaphus* x *woodhousii*) 470-472; *Xyrauchen texanus* 542-550; *Urosaurus ornatus* 804-812.
- Arkansas, *Crystallaria asprella* 68-78; *Etheostoma* (*Nothonotus*) 300-318; *Lythrurus* (*snelsoni*, *umbrae*) 493-497.
- Atlantic Ocean, *Lasiognathus* (*bebei*, [E.W.], *saccostoma* [E.W.], *intermedius* n. sp. [W.S]) 401-409; *Merluccius hubbsi* (SW), *Trachurus lathami* (W) 586-598.
- Australia, *Varanus mertensi* (NT) 354-362; *Chelodina rugosa*, *Elseya dentata* (NT) 409-419; *Tandanus tandanus* (NSW, QLD) 526-534; *Chromis nitida* (QLD) 726-729; *Crocodylus johnstoni* (QLD) 978-988; *Apogon australis* = *Denariius australis*, *Apogonichthys gillii* (QLD) 1029-1031.
- Azores, *Parablennius sanguinolentus parvicornis* 216-219.
- Belize, *Haemulon flavolineatum* 989-991.
- Borneo, *Luperosaurus yasumai* n. sp., *serraticaudus* n. sp. 433-439; *Phallostethus lehi* n. sp., *Phenacostethus* (*smithi*, *trewavasae*), *Neostethus* (*borneensis*, *bicornis*, *lankesteri*) 703-712.
- Bosnia, *Rana graeca* 223-226.
- Brazil, *Norops chrysoplepis planiceps* = *Anolis nitens nitens* 56-68; *Sternopygus xingu* n. sp. 85-102; *Micromyzon* n. gen. *akamai* n. sp. 641-648; *Magasternarchus* n. gen. (*raptor* n. sp., *duccis* n. sp.) 657-670; *Nannoptoma* n. gen. *sternopychum* n. sp. 904-912; *Gymnotus bahianus* n. sp. 937-944; *Hyloides hayeri* n. sp. 965-969; *Hyboplopoma steindachneri*, *Parotocinclus maculicauda* 1031-1035; *Paralichthys* (patagonicus = *bicyclophorus*) 1035-1037.
- Brunei, *Phallostethus lehi* n. sp., *Phenacostethus* (*smithi*, *trewavasae*), *Neostethus* (*borneensis*, *bicornis*) 703-712.
- California, *Bufo* (*w. woodhousii*, *w. australis*) 274-280; *Ambystoma californiense* 895-901.
- Canada, *Thamnophis sirtalis* 183-189; *Acipenser o. oxyrinchus* (N. Brun., Que.) 464-469; *Pseudacris erueijer* (Ont.) 517-525; *Culaea inconstans* (Alb., Que.) 563-575; *Lepomis gibbosus* (Ont.) 649-656; *Hyla versicolor* (Ont.) 729-734; *Notophthalmus viridescens* (Que.) 866-874.
- Colombia, *Eleutherodactylus* (*douglasi* n. sp., *delicatus*) 103-108; *Nannoptoma* n. gen. *spectabilis* 904-912.
- Colorado, *Xyrauchen texanus* 542-550.
- Cook Is., *Emoia* (*cyanura*, *impar*) (*Rarotonga*) 998-1005.
- Coral Sea, *Aulastomatomorpha phospherops* 497-500.
- Costa Rica, *Hyla* (*calypsa* n. sp., *lankesteri*) 615-626; *Sphaeroides* (*rosenblatti* n. sp., *andersonianus* = *sechurae*) 677-684.
- Croatia, *Rana graeca* 223-226.
- Cuba, *Eleutherodactylus iberia* n. sp. 852-859.
- Delaware, *Cynoscion regalis* 195-199.
- Ecuador, *Norops chrysoplepis scyphus* = *Anolis nitens scyphus* 56-68; *Eleutherodactylus galdi* 103-108; *Cyphocharax* (*latidivinus* n. sp., *gouldingi*) 109-113; freshwater fishes (223 spp.) 875-894; *Nannoptoma* n. gen. (*spectabilis*, *sternopychum* n. sp.) 904-912.
- Florida, *Alligator mississippiensis* 212-216, 739-743; *Sistrurus miliarius barbouri* 389-401; *Acipenser oxyrinchus desotoi* 464-469; *Bufo terrestris* 485-488; *Hippocampus zosterae* 634-640; *Lutjanidae* (14 spp. in W. Atlantic) 715-721.
- Georgia, *Desmognathus quadramaculatus* 78-84; *Rana utricularia* 455-459; *Acipenser o. oxyrinchus* 464-469; *Cyprinella venusta* 773-783.
- Grande Comore I., *Latimeria chalumnae* 606-615.
- Hawaii, *Centropyge potteri* 209-212; all freshwater fishes (5 spp.) 330-335; *Paracirrhites arcatus* 362-371; *Dascyllus albisella* 735-739.
- Idaho, *Chrysemys picta* 114-130.
- Illinois, *Siren intermedia* 29-41; *Hybognathus nuchalis* 41-55.
- Indian Ocean, *Aulastomatomorpha phospherops* 497-500; *Latimeria chalumnae* 606-615; *Perulibatrachus kilburni* n. sp. 901-904; *Neoharriotta pumila* n. sp. 955-965.
- Indonesia, *Luperosaurus yasumai* n. sp. (Kal.) 433-439; *Phenacostethus smithi* (Kal.) 703-712.
- Iowa, *Bufo* *w. woodhousii* 274-280; *Culaea inconstans* 563-575.
- Jamaica, *Scarus iserti* 189-192.
- Japan, *Hemipterus villosus* 452-454; *Hynobius retardatus* 478-483; *Branchiostegus japonicus* 743-746.
- Kentucky, *Etheostoma* (*Nothonotus*) 300-318; *Lythrurus fasciolaris* 813-823.
- Kenya, *Leptotyphlops macrops* n. sp. 162-166.
- Louisiana, *Cyprinella venusta* 773-783; *Necturus beyeri* 927-937.
- Madagascar, *Boophis* (*granulosus* = *guibei*) 1010-1012.
- Malawi, *Gynotilapia afra* x *Pseudotropheus zebra* 203-208; *Petrotilapia chryso* n. sp. 695-702.
- Malaysia, *Luperosaurus serraticaudus* n. sp. (Sar.) 433-439; *Ropalophrynus p. pleurostigma* (Sab., Sar.) 440-445; *Phallostethus lehi* n. sp., *Phenacostethus* (*smithi*, *trewavasae*), *Neostethus* (*bicornis* (Sar.)) 703-712.
- Massachusetts, *Pseudemys rubriventris bangsi* 192-195.
- Mexico, *Cnemidophorus* (*tigris dickersonae* = *tigris disparilis* [Baja Cal.], *tigris gracilis* = *tigris punctilinealis* [Son.]) 140-148; *Albula vulpes* (Son.) 181-183; *Sphaeroides* (*lisps* n. sp. [Baja Cal.], *andersonianus* = *sechurae*) 677-684.
- Michigan, *Lepomis macrochirus* 348-354; *Cottus bairdi* 488-493; *Culaea inconstans* 563-575; *Pseudacris* (*crucifer*, *triseriata*) 599-605.
- Minnesota, *Culaea inconstans* 563-575.
- Mississippi, *Hybognathus nuchalis* 41-55; *Scaphirhynchus suttkusi* 241-273; *Etheostoma* (*Nothonotus*) 300-318; *Acipenser oxyrinchus desotoi* 464-469; *Cyprinella venusta* 773-783; *Etheostoma caeruleum* 1005-1010.
- Missouri, *Micropterus dolomieu* 995-998.
- Nebraska, *Hybognathus placitus* 41-55; *Bufo* *w. woodhousii* 274-280.
- Nevada, *Xyrauchen texanus* 542-550.
- New Jersey, *Pseudemys rubriventris* 192-195; *Bufo fowleri* 274-280; *Bufo woodhousii fowleri* 970-977.
- New Mexico, *Hybognathus* (*amarus*, *placitus*) 41-55;

- Cnemidophorus (ignis gracilis = ignis punctilinealis)* 140-148; *Culaea inconstans* 563-575; *Cnemidophorus (perplexus = neomexicanus)* 945-954.
- New York, *Etheostoma (Nothonotus)* 300-318; *Acipenser o. oxyrinchus* 464-469.
- North Carolina, *Cyrinophilus porphyriticus* 199-203; *Etheostoma (Nothonotus)* 300-318; *Desmognathus (quadramaculatus, monticola, ocoee, wrighti)* 783-790; *Lythrurus matutinus* 813-823.
- Norway, *Gasterosteus aculeatus* 832-838.
- Ohio, *Ambystoma (jeffersonianum, maculatum)* 372-378; *Culaea inconstans* 563-575.
- Oklahoma, *Hybognathus nuchalis* 41-55; Great Plains fishes 280-289; *Crotaphytus collaris* 336-347; *Lythrurus (snelsoni, umbratilis)* 493-497.
- Oregon, *Cottus (marginatus, beldingi)* 1012-1016.
- Pacific Ocean, *Paracirrhites arcatus* (S. W., Cen.) 362-371; *Lasiognathus (beebie)* [Cen.], *waltoni* [Cen.], *saccostoma* [Cen.], *intermedius* n. sp. (S.) 401-409; *Merluccius (productus [NE], grayi [SE])*, *Trachurus (s. symmetricus [NE], s. murphyi [SE])*, *Scomber japonicus (NE, SE)* 586-598; *Emoia (cyanura, impar)* (trop. islands) 998-1005.
- Panama, *Hyla (calypsa n. sp., lancasteri)* 615-626; *Sphoeroides rosenblatti* n. sp. 677-684.
- Pennsylvania, *Alosa sapidissima* 226-228; *Culaea inconstans* 563-575.
- Peru, *Sphoeroides (andersonianus = securae)* 677-684; *Nannotopoma n. gen. (spectabilis, sternoptychum n. sp.)* 904-912.
- Puerto Rico, *Gramma loreto* 1-8; *Albula* sp. 181-183; *Acanthurus (bahianus, coeruleus)* 189-192; *Anolis gundlachi* 535-542; *Gramma loreto* 1037-1043.
- Rarotonga I., *Emoia (cyanura, impar)* 998-1005.
- Red Sea, *Hippocampus harid* 483-485.
- Saudi Arabia, *Hippocampus harid* 483-485.
- Serbia, *Rana graeca* 223-226.
- Socotra Is., *Neoharriotta pumila* n. sp. 955-965.
- Somalia, *Neoharriotta pumila* n. sp. 955-965.
- South Africa, *Thelotornis capensis* 290-299; *Cordylus cordylus* 839-845; *Perulibatrachus kilburni* n. sp. 901-904.
- South America, *Cynolebias* (13 spp.) 1016-1022.
- South Carolina, *Coluber constrictor* 8-14; *Myriopholis microlepis* 167-180; *Lepomis macrochirus* 459-462; aquatic freshwater turtles (10 spp.) 713-715; *Lepomis marginatus* 845-851.
- Spain, *Psammodromus algirus* 208-209; *Lacerta lepida* 722-726; *Alestes* (fossils) 746-750; *Alytes (obstetricans, cisternasii)* 824-831; *Podarcis hispanica atrata* 991-994.
- Sweden, *Lacerta agilis* 462-464.
- Tanzania, *Leptotyphlops macrops* n. sp. 162-166.
- Tennessee, *Hybognathus nuchalis* 41-55; *Etheostoma (Nothonotus)* 300-318; *Plethodon cinereus* 576-586; *Lythrurus fasciolaris* 813-823.
- Texas, *Hybognathus amarus* 41-55; *Bufo (w. woodhousii, w. australis)* 274-280; *Crotalus lepidus* 319-329; *Cyprinella venusta* 773-783.
- Thailand, *Kalophrynus pleurostigma interlineatus* = *K. interlineatus* 440-445.
- U. S. Virgin Is., *Sparisoma rubripinne* 189-192.
- Uruguay, *Phrynos (P. geoffroanus complex)* (fossil) 445-451.
- Utah, *Bufo w. woodhousii* 274-280; *Xyrauchen texanus* 542-550.
- Venezuela, *Iguana iguana* 219-221; *Aphanotorulus ammophilus* n. sp. 379-389; *Corynopoma riisei* 627-633; *Chaetostoma (yurubienne n. sp., stannii)* 671-677; *Bufo marinus* 904-912; *Nannotopoma n. gen. spectabilis* 904-912.
- Virginia, *Lythrurus ardens* 813-823; *Micropterus dolomieu* 995-998.
- Washington, *Chrysemys picta* 114-130; *Novumbra hubbsi* 684-695; *Cottus (marginatus, beldingi)* 1012-1016.
- West Virginia, *Micropterus dolomieu* 995-998.
- Wisconsin, *Culaea inconstans* 563-575.
- Yugoslavia, *Rana graeca* 223-226.
- Zaire, *Aethiomastacembelus (robertsi n. sp., congicus, marche)* 130-139.
- Zambia, *Thelotornis capensis* 290-299.
- GROWTH, *Crystallaria asprella* (rate in wild) 68-78; *Chrysemys picta* (in anthropogen. nutrient-enhanced hab.) 114-130; *Myriopholis microlepis* (prey shift increases growth rate) 167-180; *Alligator mississippiensis* (rates low in S. Everglades) 212-216; *Crotalus lepidus* (life hist. conseqs. of energy budget diffs. btwn. popns.) 319-329; *Ambystoma (jeffersonianum, maculatum)* (of larvae, aff. by inter- & intrasp. dens. increases) 372-378; *Notophthalmus viridescens* (rate diffs. btwn. popns.) 866-874.
- HABITAT, *Coluber constrictor* (activ., met. rate, water flux compar. to rel. in dryer hab.) 8-14; *Gila cypha* (hab. use rel. to dam & reprod.) 15-28; *Norops chrysolepis scyphus* = *Anolis nitens scyphus*, *Norops chrysolepis planiceps* = *Anolis nitens nitens* (interspopn. diffs. in hab. & microhab.) 56-68; *Crystallaria asprella* (microhab., assoc. fauna) 68-78; *Desmognathus quadramaculatus* (hab. & microhab. rel. to territor.) 78-84; *Eleutherodactylus douglasi* n. sp. (microhab. notes) 103-108; *Cyphocharax (latilavatus n. sp., gouldingi)* (notes) 109-113; *Chrysemys picta* (life hist. in anthropogen. nutrient-enhanced hab.) 114-130; *Aethiomastacembelus robertsi* n. sp. (notes) 130-139; *Leptotyphlops macrops* n. sp. (notes) 162-166; *Scaphirhynchus sulkus* (notes) 241-273; Great Plains fishes (seas. change in spp., main & trib. stream compar., rel. to environ. var.) 280-289; *Thelotornis capensis* (arboreal snake takes 50% terrest. prey) 290-299; *Crotalus lepidus* (hab. in energy budget diffs. btwn. popns.) 319-329; *Lepomis macrochirus* (hab. specializ. w/in popn.) 348-354; *Varanus mertensi* (met. rate, water flux in aquat. vs terrest. hab.) 354-362; *Paracirrhites arcatus* (color morph freq. rel. to depth & branching coral quants.) 362-371; *Ambystoma (jeffersonianum, maculatum)* (intersp. compct. btwn. larvae, microhab. changes) 372-378; *Aphanotorulus (ammophilus n. sp., popoi)* (notes)

- 379–389; *Chelodina rugosa*, *Elseya dentata* (diets in diff. habs., wet & dry seas.) 409–419; *Luperosaurus yasumai* n. sp., *serraticaudus* n. sp.) (notes) 433–439; *Kalophrynus* (p. *pleurostigma*, p. *interlineatus* = *interlineatus*) (spp. diffs. in breeding hab.) 440–445; *Hipposcarus harid* (of coral reef spawning aggreg.) 483–485; *Bufo terrestris* (hab. complex, aff. pred. on tdpls.) 485–488; *Bufo terrestris* (physical params. of position holding in benthic habs.) 488–493; *Lythrurus* (*snelsoni*, *umbratilis*) (hab. diffs. btwn. parapatric spp.) 493–497; *Anolis gundlachi* (lack of therm. acclim. in met. rate rel. to hab.) 535–542; *Pseudacris* (*crucifer*, *triseriata*) (tdpl. distrib. rel. to pond-drying, preds.) 599–605; *Hyla* (*calypsa* n. sp., *lancasteri*) (spp. diffs.) 615–626; *Micromyzon* n. gen. *akamai* n. sp. (notes) 641–648; *Magosternarchus* n. gen. (*raptor* n. sp., *duccis* n. sp.) (notes) 657–670; *Chaetostoma* (*yurubense* n. sp., *stannii*) (notes, contrast btwn. spp.) 671–677; *Sphoeroides* (*lispus* n. sp., *rosenblatti* n. sp.) (notes) 677–684; *Petrotilapia chrysos* n. sp. (notes) 695–702; *Phallostethus lehi* n. sp. (notes) 703–712; *Dasyllus albisella* (larval coral choice by olfac. cues) 735–739; *Desmognathus* (*quadramaculatus*, *monticola*, *ocoe*, *wrighti*) (body size rel. to aquat. vs. terrest. hab.) 783–790; *Gasterosteus aculeatus* (lat. plate polymorph. rel. to salin. of hab.) 832–838; *Eleutherodactylus iberia* n. sp. (notes) 852–859; Ecuadorian freshwater fishes (223 spp.) (fish commun. pttns. corresp. to hab. & altit.) 875–894; *Perulibatrachus kilburni* n. sp. (notes) 901–904; *Bufo marinus* (breeding site charcs.) 904–912; *Hylodes heyeri* n. sp. (notes) 965–969; *Emoia* (*cyanura*, *impar*) (segreg. in cryptic spp.) 998–1005; *Gramma loreto* (nesting microhab., var. aff. mating beh.) 1037–1043.
- HEARING, *Atelopus chiriquiensis*, *Hyla regilla* (in frogs w/ & w/out middle ear) 428–432.
- HERMAPHRODITISM, *Centropyge potteri* (size-depend. rate of protogyn. sex change) 209–212; *Bufo* (*microscaphus* × *woodhousii*) (wild herm. individ.) 470–472.
- HIBERNATION, *Lacerta agilis* (select. advant. of female emerg. later than male) 462–464; *Pseudacris crucifer* (biochem. adapts. to freezing) 517–525.
- HISTOLOGY, *Bufo* (*microscaphus* × *woodhousii*) (wild hermaphr. individ.) 470–472; *Corynopoma riisei* (of gill glands in ad. males) 627–633; *Necturus beyeri* (spermathecae, long-term sperm stor.) 927–937; *Gramma loreto* (of gonads, rel. to reprod. activ.) 1037–1043.
- HOME RANGE, *Coluber constrictor* (rel. to activ., met. rate, temp.) 8–14; *Desmognathus quadramaculatus* (territ. size, mark-recap.) 78–84; *Psammodyromus algirus* (long-term red. in home range w/ tail loss) 208–209; *Crotaphytus collaris* (gender & age-size class diffs. in territor.) 336–347; *Gramma loreto* (of nesting males, territ.) 1037–1043.
- HYBRIDIZATION, *Hybogonathus* (*amarus*, *placitus*) (*H. amarus* × *H. placitus* after *H. placitus* introd.) 41–55; *Cynotilapia afra* × *Pseudotropheus zebra* (with intra-lake translocation) 203–208; *Bufo* (*microscaphus* × *woodhousii*) (wild hermaph. individ.) 470–472; *Lythrurus* (*snelsoni*, *umbratilis*) (in rare overlap of parapatric spp.) 493–497; *Cnemidophorus* (*perplexus* = *neomexicanus*) (hybrids not same as *C. perplexus* lectotype) 945–954.
- LARVAE, *Gramma loreto* (describe hatchls.) 1–8; *Siren intermedia* (cranial ontog., unique paedomorph.) 29–41; *Mycteroperca microlepis* (ontog. of diet & oral morph., larv. to juvs.) 167–180; larval fishes (tool to observe larval fish specimens) 221–223; all Hawaiian freshwater fishes (5 spp.) (mtDNA evid. of inter-island dispersal) 330–335; *Ambystoma* (*jeffersonianum*, *maculatum*) (compet. w/in & btwn. spp.) 372–378; *Rana utricularia* (fright resp. of tdpls. to pred. chems.) 455–459; *Hynobius retardatus* (density aff. larv. head size, rel. to cannib.) 478–483; *Bufo terrestris* (hab. complex, aff. pred. on tdpls.) 485–488; *Pseudacris* (*crucifer*, *triseriata*) (tdpl. distrib. rel. to pond-drying, preds.) 599–605; *Hyla* (*calypsa* n. sp., *lancasteri*) (describe, hab., dev.) 615–626; *Novumbra hubbsi* (dev. to juv., no metamorph., system. charcs. for higher class.) 684–695; *Dasyllus albisella* (larval coral choice by olfac. cues) 735–739; *Alytes* (*obstetricans*, *cisternasi*) (tdpl. size rel. to pater. size) 824–831; *Ambystoma californiense* (large ann. var. in age at metamorph.) 895–901.
- LATERAL LINE, *Alosa sapidissima* (unique neuro-mast config. for teleosts) 226–228; *Harengula*, *Herklotsichthys*, *Opisthonema*, *Amblygaster*, *Sardinella* (in phylogen. anal.) 475–478; *Lattieria chalumnae* (epicaudal fin lat. line funct.) 606–615; *Neoharriotta pumila* n. sp. (describe) 955–965.
- LIFE HISTORY, *Crystallaria asprella* 68–78; *Chrysomys picta* (of 2 popns. in anthropogen. nutrient-enhanced habs.) 114–130; *Thamnophis sirtalis* (geogr. var. diff. to explain) 183–189; *Alligator mississippiensis* (slow growth, small body size, late sex. matur. in S. Everglades) 212–216; *Crotalus lepidus* (conseqs. of energy budget diffs. btwn. popns.) 319–329; *Novumbra hubbsi* (early life hist. charcs. for higher class.) 684–695; *Desmognathus* (*quadramaculatus*, *monticola*, *ocoe*, *wrighti*) (evol. body size rel. to life hist.) 783–790; *Notophthalmus viridescens* (diffs. btwn. popns.) 866–874; *Micropterus dolomieu* (diffs. btwn. popns. of introd. bass) 995–998; *Etheostoma caeruleum* (need stndrd. methods to measure life hist. traits) 1005–1010.
- LOCOMOTION, *Cottus bairdi* (physical params. of position holding) 488–493; *Latimeria chalumnae* (funct. of epicaudal fin in wild) 606–615.
- METHODS, Istiophoridae (7 spp.), Xiphiidae (1 sp.) (rostral charcs. ident. all spp.) 148–161; *Iguana iguana* (sex determ. in hatchls. & juvs.) 219–221; larval fishes (tool to observe larval fish specimens) 221–223; *Lepomis macrochirus* (elect. conduct. estimates lean body mass & lipid mass on live fish) 459–462; *Bufo terrestris* (estim. field met. rate by 86Rb elimin. rate) 791–804; *Etheostoma caeruleum* (need stndrd. methods to measure darter repro. traits) 1005–1010; *Cottus* (*marginatus*, *beldingi*) (taxon. charcs. to ident. endngrd. sp. from sympatric congener) 1012–1016.

MIGRATION, *Gila cypha* (mvmnts. rel. to hab. change due to dams & reprod.) 15–28; aquatic freshwater turtles (10 spp.) (males migr. farther than females) 713–715; *Ambystoma californiense* (breeding migr., ann. var.) 895–901.

MITOCHONDRIAL DNA, all Hawaiian freshwater fishes (5 spp.) (evid. of gene flow btwn. islands) 330–335; *Acipenser* (*o. oxyrinchus*, *o. desotoi*) (mtDNA seq. anal. supports subsp. design.) 464–469; *Xyrauchen texanus* (isol. popns. not diverg., mtDNA data) 542–550; *Culaea inconstans* (mtDNA var. btwn. popns., phylogen. anal., biogeogr. ptms.) 563–575; Lutjanidae (14 spp. in W. Atlantic) (for clad. anal.) 715–721; Crotalinae (30 spp., all genera) (in phylogen. anal. generic rels.) 763–773; *Cyprinella venusta* (phylogen. anal. of mtDNA lineages, discord. with subspp.) 773–783; *Micropterus dolomieu* (determ. ancestry of introd. popns.) 995–998.

MORPHOLOGY, *Siren intermedia* (cranial ontog., unique paedomorph.) 29–41; *Mycteroperca microlepis* (ontog. of diet & oral morph., larv. to juvs.) 167–180; *Lasiognathus* (*beebie*, *waltoni*, *saccostoma*, *intermedius* n. sp.) (of escae, as system. charc.) 401–409; *Micromyzon* n. gen. *akamai* n. sp. (well-dev. body armor) 641–648; *Gasterosteus aculeatus* (lat. plate polymorph. in marine & estuar. habs.) 832–838; *Cynolebias* (13 spp.) (of surface of chorion, sp. specific, phylogen. implcs.) 1016–1022; *Paracanthopterygii* (pediculate), *Gobiesocidae*, *Callionymidae*, *Perciformes* (of cranial nerve IX pathway & other proposed synaps. of *Paracanthopterygii*) 1022–1029.

NESTING, *Gramma loreto* (male guarding, nest in holes) 1–8; *Parablennius sanguinolentus parvicornis* (male injuries rel. to nesting seas.) 216–219; *Lepomis gibbosus* (pred. aff. nesting success) 649–656; *Lepomis marginatus* (nest-guarding w/ & w/out preds.) 845–851; *Gramma loreto* (reprod. aggregrs., ctshp. beh., nest care) 1037–1043.

NOMENCLATURE, *Cnemidophorus* (*tigris dickersonae* = *tigris disparilis*, *tigris gracilis* = *tigris punctilinealis*) (changes in name priorities from reident. of types) 140–148; *Pseudemys rubriventris* (evid. against subsp. design.) 192–195; *Aphanotorulus* (*ammophilus* n. sp., 6 other spp.) (n. sp., redescr. genus, move 4 spp. from *Hypostomus* to *Aphanotorulus*) 379–389; *Kalophrynus* (*p. pleurostigma*, *p. interlineatus* = *interlineatus*) (subsp. raised to sp. status) 440–445; *Aulastomatomorpha phospherops* (only one valid sp. in gen.) 497–500; *Sphaeroides* (*lispus* n. sp., *rosenblatti* n. sp., *andersonianus* = *sechurae*) (n. spp., synonym. spp.) 677–684; *Lythrurus* (*ardens*, *fasciolaris*, *matutinus*) (resurrect sp., elevate subspp.) 813–823; *Cnemidophorus* (*perplexus* = *neomexicanus*) (ident. *C. perplexus* lectotype as *C. neomex.*, type local. problems, petit. to suppress *C. perplexus*) 945–954; *Boophis* (*granulosus* = *guibei*), *Stauris natator* (*B. granulosus* invalid, holotype coll. # corrected, add to synonym. of *S. natator*) 1010–1012; *Apogon australis* = *Denariusa australis*, *Apogonichthys gillii* (ident. of Steindachner spp.,

types discovered & design.) 1029–1031; *Hypotopoma steindachneri*, *Parotocinclus maculicauda* (type designs.) 1031–1035; *Paralichthys* (*patagonicus* = *bicyclophorus*) (*P. patagonicus* senior synonym., lecto-types design.) 1035–1037.

OLFACTION, *Crotalus varidis oreganus* (import. in strike beh.) 419–428; *Dascyllus albisella* (larval coral choice by olfac. cues) 735–739; *Cordylus cordylus* (pherom. detect. & sex discrim.) 839–845.

OSTEOLOGY, *Siren intermedia* (cranial ontog., unique paedomorph.) 29–41; *Hybognathus* (*amarus*, *nuchalis*, *placitus*) (compar.) 41–55; *Sternopygus xingu* n. sp. (in phylogen. anal. of genus) 85–102; *Eleutherodactylus* (*douglasi* n. sp., *delicatus*, *galdi*) (unique to spp.) 103–108; *Istiophoridae* (7 spp.), *Xiphiidae* (1 sp.) (rostral charcs. ident. all spp.) 148–161; *Harengula*, *Herklotsichthys*, *Opisthonema*, *Amblygaster*, *Sardinella* (in phylogen. anal.) 475–478; *Ostraciidae* (reinterp. of vert. fusions, phylogen. implcs.) 859–865; *Nannotopoma* n. gen. *spectabilis*, *sternopychum* n. sp.) (charcs. disting. genus) 904–912.

PALEONTOLOGY, *Istiophoridae* (7 spp.), *Xiphiidae* (1 sp.) (rostral charcs. ident. all spp.) 148–161; *Phrynos* (*P. geoffroanus* complex) (1st fossil of genus in Uruguay) 445–451; *Alestes* (fossils) (lower Eocene characids in Europe) 746–750.

PARASITISM, *Lepomis macrochirus* (as indicator of hab. specializ. w/in popn.) 348–354.

PARTHENOGENESIS, *Cnemidophorus* (*perplexus* = *neomexicanus*) (ident. of parthen. sp. lectotype) 945–954.

PHEROMONES, *Desmognathus quadramaculatus* (in territor.) 78–84; *Corynopoma riisei* (gill glands of ad. males, secrete pher.) 627–633; *Cordylus cordylus* (pherom. detect. & sex discrim. in *Cordylidae*) 839–845.

PHYLOGENETIC ANALYSIS, *Sternopygus xingu* n. sp. (clad. anal. of genus, biogeogr. notes) 85–102; *Eleutherodactylus* (*douglasi* n. sp., *delicatus*, *galdi*) (clad. anal., sister spp.) 103–108; *Aethiomastacembelus* (*robertsi* n. sp., *congicus*, *marchei*), *Caecomastacembelus brichardi* (compar. to family phylog., synaps. defining genera incorrect) 130–139; *Scaphirhynchus suttkusi* (clad. anal. of fam., sister groups) 241–273; *Etheostoma* (*Nothonotus*) (16 spp.) (clad. anal., electroph., beh., morph. charcs.) 300–318; all Hawaiian freshwater fishes (5 spp.) (of island popns. w/in spp.) 330–335; *Harengula*, *Herklotsichthys*, *Opisthonema*, *Amblygaster*, *Sardinella* (rel. btwn. genera, osteol. & lat. line data) 475–478; *Aulastomatomorpha phospherops*, *Conocara*, *Leptoderma* (synaps. for 3 genera, autaps. for *Aulastomatomorpha*) 497–500; *Uraeotyphlidae* (clad. anal. of fam. among caecilians) 550–562; *Culaea inconstans* (clad. anal. of popns., mtDNA data) 563–575; *Micromyzon* n. gen. *akamai* n. sp. (clad. anal.) 641–648; *Magosternarchus* n. gen. (*raptor* n. sp., *duccis* n. sp.) (clad. anal. of fam.) 657–670; *Phallostethus lehi* n. sp., *Phenacostethus smithi* (clad. anal. of subfam., and all 6 Bornean spp. [2

subfams.], rel. to biogeogr.) 703–712; Lutjanidae (14 spp. in W. Atlantic) (clad. anal., mtDNA data) 715–721; Crotalinae (30 spp., all genera) (clad. anal. generic rels., mtDNA data) 763–773; *Cyprinella venusta* (phylogen. anal. of mtDNA clades, discord. with subsp.) 773–783; Ostraciidae (clad. anal. of genera, reinterp. of vert. fusions) 859–865; *Nannotopoma* n. gen. (*spectabilis*, *sternoptychum* n. sp.) (notes on intergen. rels.) 904–912; *Gymnotus bahianus* n. sp. (synap. for genus) 937–944; *Cynolebias* (13 spp.) (phylogen. implics. of morph. of surface of chorion) 1016–1022; Paracanthopterygii (pediculate), Gobiesocidae, Callionymidae, Perciformes (discuss. of synaps. & higher class. of fishes) 1022–1029.

PHYSIOLOGY, *Coluber constrictor* (met. rate, water flux, temp. in wild) 8–14; *Sternopygus xingu* n. sp. (electric fish, phylogen. anal. rel. to elect. product.) 85–102; *Crotalus lepidus* (met. rate in energy budget diff. btwn. popns.) 319–329; *Varanus mertensi* (met. rate, water flux in semiaquat. lizard, seas. compar.) 354–362; *Lepomis macrochirus* (elect. conduct. estimates lean body mass & lipid mass on live fish) 459–462; *Pseudacris crucifer* (biochem. adapts. to freezing) 517–525; *Anolis gundlachi* (lack of therm. acclim. in met. rate) 535–542; *Bufo terrestris* (estim. field met. rate by 86Rb elimin. rate) 791–804; *Urosaurus ornatus* (physiol. color change in iridophores) 804–812.

POPULATIONS, *Gila cypha* (estim., mvmts. rel. to hab. disturb.) 15–28; *Norops chrysolepis scyphus* = *Anolis nitens scyphus*, *Norops chrysolepis planiceps* = *Anolis nitens nitens* (ecol. var. btwn. 2 popns.) 56–68; *Crystallaria asprella* (demogr. compar. btwn. popns.) 68–78; *Desmognathus quadramaculatus* (dens., territor.) 78–84; *Chrysomys picta* (life hist. of 2 popns. in anthropogen. nutrient-enhanced habs.) 114–130; *Albula (vulpes)*, sp. (electroph. evid. for Caribbean popns. sp. status) 181–183; *Thamnophis sirtalis* (geogr. var. in repro. traits diff. to explain) 183–189; *Pseudemys rubriventris* (low genet. divers. btwn. & w/in popns., evid. against subsp. desig.) 192–195; *Gyrinophilus porphyriticus* (size-rel. interpopn. mating barriers) 199–203; *Crotalus lepidus* (life hist. consequ. of energy budget diff. btwn. popns.) 319–329; all Hawaiian freshwater fishes (5 spp.) (evid. of gene flow btwn. island popns.) 330–335; *Lepomis macrochirus* (hab. specializ. w/in popn.) 348–354; *Xyrauchen texanus* (isol. popns. not diverg., mtDNA data) 542–550; *Culaea inconstans* (mtDNA var. btwn. popns., phylogen. anal., biogeogr. pttns.) 563–575; *Lepomis gibbosus* (diff. nest pred. btwn. popns., eff. on nesting success) 649–656; *Gasterosteus aculeatus* (lat. plate polymorph. in 27 salt-water popns.) 832–838; *Notophthalmus viridescens* (growth & popn. struct. diff. btwn. popns.) 866–874; *Micropterus dolomieu* (mtDNA evid. of ancestry of introd. popns.) 995–998.

PREDATION, *Norops chrysolepis scyphus* = *Anolis nitens scyphus*, *Norops chrysolepis planiceps* = *Anolis nitens nitens* (popn. diff. in prey size) 56–68; *Mycroptera microlepis* (ontogeny of prey-shift & oral morph., larv. to juvs.) 167–180; *Thelotornis ca-*

pensis (arboreal snake takes 50% terrest. prey) 290–299; *Paracirrhites arcatus* (possibly rel. to color morph. freq.) 362–371; *Ambystoma (jeffersonianum, maculatum)* (larger larvae prey on smaller) 372–378; *Chelodina rugosa*, *Elseya dentata* (prey changes in wet & dry seas.) 409–419; *Crotalus viridis oreganus* (strike beh. w/ sens. depriv.) 419–428; *Rana utricularia* (fright resp. of tdpls. to pred. chems.) 455–459; *Bufo terrestris* (hab. complex. aff. pred. on tdpls.) 485–488; *Plethodon cinereus* (head shape rel. to prey size) 576–586; *Pseudacris (crucifer, triseriata)* (tdpl. distrib. rel. to pond-drying, preds.) 599–605; *Lepomis gibbosus* (aff. nesting success) 649–656; *Lacerta lepida* (levels of bird pred. on lizards, hypoth. of defens. behs.) 722–726; *Chromis nitida* (foraging schools beh. rel. to pred. & compet.) 726–729; *Desmognathus (quadramaculatus, monticola, ocoee, wrighti)* (rel. to adapt. rad. body size & life hist.) 783–790; *Lepomis marginatus* (eff. of preds. on nest-guarding) 845–851; *Crocodylus johnstoni* (ontogen. changes in prey type) 978–988; *Haemulon flavolineatum* (anti-pred. mobbing in fish school) 989–991.

REPRODUCTION, *Gramma loreto* (male nesting, mating, egg devel., coral reef) 1–8; *Gila cypha* (migr. rel. to reprod. & hab. disturb. due to dams) 15–28; *Crystallaria asprella* (seas., egg size, clutch size, body size at sex. matur.) 68–78; *Chrysomys picta* (clutch size, age & size at sex. matur. in anthropogen. nutrient-enhanced habs.) 114–130; *Thamnophis sirtalis* (geogr. var. diff. to explain) 183–189; *Sparisoma rubripinne*, *Acanthurus (bahianus, coerules)*, *Scarus iserti* (spawning aggreg. sites used 12–28 yrs.) 189–192; *Cynoscion regalis* (drumming, ctshp. & spawning in captiv.) 195–199; *Gyrinophilus porphyriticus* (size-rel. interpopn. mating barriers) 199–203; *Psammotromus alginus* (males w/ tail loss red. access to females) 208–209; *Centropyge potteri* (diff. that size not only factor in protogyn. sex change) 209–212; *Alligator mississippiensis* (small size, advanced age at sex. matur. in S. Everglades) 212–216; *Parablenius sanguinolentus parvicornis* (male injuries rel. to reprod. seas.) 216–219; Great Plains fishes (rel. to seas. change in spp. abund.) 280–289; *Thelotornis capensis* (seas., ovipar., fecund.) 290–299; *Crotalus lepidus* (life hist. consequ. of energy budget diff. btwn. popns.) 319–329; *Crotaphytus collaris* (gender & age-size class diff. in territ., male age-size class mating success) 336–347; *Sistrurus miliarius barbouri* (seas. rel. to temp., in subtropps) 389–401; *Hemitripterus villosus* (ctshp. & cop., unique type sperm transfer, egg-laying) 452–454; *Lacerta agilis* (select. advant. of female emerg. later than male) 462–464; *Bufo (microscaphus × woodhousii)* (egg-laying calling wild hermaphr. individ.) 470–472; *Hippocampus harid* (coral reef spawning aggreg.) 483–485; *Hyla calypsa* n. sp. (eggs/clutch, loc., describe eggs & larvae) 615–626; *Corynopoma riisei* (ad. male gill glands, secrete fem. attract.?) 627–633; *Hippocampus zosterae* (ctshp. beh.) 634–640; *Lepomis gibbosus* (pred.

- aff. nesting success) 649–656; *Novumbra hubbsi* (egg & larv. dev., system. charcs. for higher class.) 684–695; *Hyla versicolor* (male mating success rel. to chorus attendance) 729–734; *Branchiostegus japonicus* (captive spawning beh., egg mass descript.) 743–746; *Desmognathus quadramaculatus*, *monticola*, *ocoe*, *wrighti*) (evol. body size rel. to repro. traits) 783–790; *Alytes (obstetricans, cisternasi)* (tdpl. size rel. to pater. size, rel. to female mate choice) 824–831; *Cordylus cordylus* (pherom. detect. & sex discrim.) 839–845; *Lepomis marginatus* (nest-guarding w/ & w/out preds.) 845–851; *Eleutherodactylus iberia* n. sp. (smallest tetrapod, one egg per clutch) 852–859; *Ambystoma californiense* (high ann. var. in reprod. rel. to rainfall) 895–901; *Bufo marinus* (breeding site charcs.) 904–912; *Necturus beyeri* (ultrastruct. spermathecae, long-term sperm stor.) 927–937; *Bufo woodhousii fowleri* (female choice of male calls) 970–977; *Etheostoma caeruleum* (seas., egg size, clutch size, need stndrd. methods to measure) 1005–1010; *Gramma loreto* (ctshp. beh., seas., nesting, size of mating males, female choice) 1037–1043.
- RESPIRATION**, *Crotalus lepidus* (resp. rate in energy budget diffs. btwn. popns.) 319–329; *Anolis gundlachi* (lack of therm. acclim. in met. rate) 535–542; *Bufo terrestris* (estim. field met. rate by 86Rb elimin. rate) 791–804.
- SALINITY**, *Gasterosteus aculeatus* (lat. plate polymorph. rel. to salin. of hab.) 832–838.
- SEX**, *Iguana iguana* (sex determ. in hatchls. & juvs.) 219–221; *Crotaphytus collaris* (gender diffs. in soc. beh.) 336–347; *Sistrurus miliarius barbouri* (sex ratio in subtropics) 389–401; *Lasiognathus (beebei, walloni, saccostoma, intermedius* n. sp.) (spp. known only from females) 401–409; *Cordylus cordylus* (pherom. detect. & sex discrim.) 839–845; *Ambystoma californiense* (breeding popn. sex ratios rel. to rainfall) 895–901.
- SEXUAL DIMORPHISM**, *Hybognathus amarus* (morph.) 41–55; *Norops chrysoplepis scypheus* = *Anolis nitens scypheus*, *Norops chrysoplepis planiceps* = *Anolis nitens nitens* (morphomet., popn. diffs.) 56–68; *Crystallaria asprella* (fin length, body size) 68–78; *Centropyge potteri* (size-depend. rate of protogyn. sex change) 209–212; *Iguana iguana* (sex determ. in hatchls. & juvs.) 219–221; *Thelotornis capensis* (male smaller head, thinner body) 290–299; *Crotaphytus collaris* (gender diffs. in soc. beh.) 336–347; *Aphanotorulus (ammophilus* n. sp., 6 other spp.) (breeding males long post. bristles & unique teeth) 379–389; *Ambystoma californiense* (males longer tails) 895–901; *Nannopliopoma* n. gen. (*spectabilis*, *sternophyllum* n. sp.) (in mating structures) 904–912; *Neoharriotta pumila* n. sp. (male sec. sex charcs.) 955–965.
- SIZE**, *Gramma loreto* (of eggs) 1–8; *Norops chrysoplepis scypheus* = *Anolis nitens scypheus*, *Norops chrysoplepis planiceps* = *Anolis nitens nitens* (body size & prey size vary btwn. popns.) 56–68; *Crystallaria asprella* (egg size, body size, sex. dimorph.) 68–78; *Desmognathus quadramaculatus* (rel. to territor. beh.) 78–84; *Chrysemys picta* (large body size due to enhanced diets aff. life hist.) 114–130; *Thamnophis sirtalis* (litter size rel. to mater. & neonate size, geogr. var. diff. to explain) 183–189; *Gyrinophilus porphyriticus* (size-rel. interpopn. mating barriers) 199–203; *Centropyge potteri* (size-depend. rate of protogyn. sex change) 209–212; *Alligator mississippiensis* (small body size in S. Everglades) 212–216; *Parablennius sanguinolentus parvicornis* (body size rel. to injuries during repro. seas.) 216–219; *Bufo (fowleri, w. woodhousii, w. australis)* (body size diffs. support taxon.) 274–280; *Crotalus lepidus* (body size rel. to energy budget diffs. btwn. popns.) 319–329; *Crotaphytus collaris* (male age-size class, territor. & mating success) 336–347; *Plethodon cinereus* (head size & shape rel. to prey size) 576–586; *Micromys* n. gen. *akamai* n. sp. (smallest aspredinids) 641–648; *Chromis nitida* (foraging schools beh. rel. to fish body size & pred. level) 726–729; *Desmognathus (quadramaculatus, monticola, ocoee, wrighti)* (evol. body size rel. to life hist.) 783–790; *Alytes (obstetricans, cisternasi)* (egg & tdpl. size rel. to pater. size) 824–831; *Eleutherodactylus iberia* n. sp. (smallest tetrapod, charcs. of min. frogs) 852–859; *Notophthalmus viridescens* (rel. to age, diffs. btwn. popns.) 866–874; *Crocodylus johnstoni* (ontogen. body size changes & prey size) 978–988; *Etheostoma caeruleum* (need stndrd. methods to measure egg size) 1005–1010; *Gramma loreto* (male size rel. to mating success) 1037–1043.
- SURVIVAL**, *Pseudacris (crucifer, triseriata)* (of tdpls. rel. to pond-drying, preds.) 599–605.
- SYSTEMATICS**, *Hybognathus (amarus, nuchalis, placatus)* (redescribe *H. amarus*, geogr. var., range change, compare to 6 congeners) 41–55; *Sternopygus xingu* n. sp. (phylogen. anal. of genus, key to gen.) 85–102; *Eleutherodactylus (douglassi* n. sp., *delicatus, galdi*) (sister spp., disjunct distribts.) 103–108; *Cyphocharax latilavivus* n. sp. 109–113; *Aethiomastacembelus (robertsi* n. sp., *congicus, marchei*), *Caecomastacembelus brichardi* (gen. charcs. incorrect) 130–139; *Istiophoridae* (7 spp.), *Xiphiidae* (1 sp.) (rostral charcs. ident. all spp., key to all spp.) 148–161; *Leptotyphlops macrops* n. sp. (compare to closest rels., *L. longicaudus* group) 162–166; *Albula (vulpes, sp.)* (electroph. evid. for Caribbean popns. sp. status) 181–183; *Pseudemys rubriventris* (low genet. divers., electroph. evid. against subsp. desig.) 192–195; *Rana graeca* (kar. varies from other *Rana*) 223–226; *Alosa sapidissima* (unique neuromast config. for teleosts) 226–228; *Scaphirhynchus suttkusi* (evid. for valid of sp., phylogen. anal.) 241–273; *Bufo (fowleri, w. woodhousii, w. australis)* (valid. of taxon., body size & call freq. data) 274–280; *Etheostoma (Nothonotus)* (16 spp.) (phylogen. anal. of subgen., biogeogr. inferences) 300–318; *Aphanotorulus (ammophilus* n. sp., 6 other spp.) (redescr. genus, move 4 spp. from *Hypostomus* to *Aphanotorulus*) 379–389; *Lasiognathus (beebei, walloni, saccostoma, intermedius* n. sp.) (revise genus, rediagn. spp. based on escae, key to spp.) 401–409; *Luperosaurus (yasumai* n. sp., *serraticaudus* n. sp.) (key to genus [8 spp.]

433-439; *Kalophrynus* (*p. pleurostigma*, *p. interlineatus* = *interlineatus*) (subsp. raised to sp. status, call charcs.) 440-445; *Acipenser* (*o. oxyrinchus*, *o. desotoi*) (mtDNA seq. anal. supports subsp. design.) 464-469; *Harengula*, *Herklotsichthys*, *Opisthonema*, *Amblygaster*, *Sardinella* (phylogen. anal., osteol. & lat. line data) 475-478; *Aulastomatomorpha phosphorops*, *Conocara*, *Leptoderma* (rev. *Aulastomatomorpha*, conclusion: only one sp., phylogen. anal. of rel. gen.) 497-500; *Tandanus tandanus* (cryptic spp., detected by electroph.) 526-534; *Uraeotyphlidae* (phylogen. position of fam. among caecilians) 550-562; *Hyla* (*calypsa* n. sp., *lancasteri*) (compare to closest rel.) 615-626; *Micromyzon* n. gen. *akamai* n. sp. (phylogen. anal.) 641-648; *Magosternarchus* n. gen. (*raptor* n. sp., *duccis* n. sp.) (phylogen. anal. of fam.) 657-670; *Chaetostoma* (*yurubense* n. sp., *stannii*) (compare to syntopic & other congeners) 671-677; *Spherooides* (*tispus* n. sp., *rosenblatti* n. sp., *andersonianus* = *sechurae*) (synon. spp., compare to congeners) 677-684; *Novumbra hubbsi* (early life hist. charcs. for higher class.) 684-695; *Petrotilapia chrysos* n. sp. (compare to rels.) 695-702; *Phallostethus lehi* n. sp., *Phenacostethus smithi* (range extens., biogeogr., phylogen. anal. subfam. & all 6 Bornean spp. [2 subfams.]) 703-712; *Lutjanidae* (14 spp. in W. Atlantic) (phylogen. anal., mtDNA data) 715-721; *Crotalinae* (30 spp., all genera) (phylogen. anal. generic rels., mtDNA data) 763-773; *Cyprinella venusta* (phylogen. anal. of mtDNA lineages, discord. with subspp.) 773-783; *Lythrurus* (*ardens*, *fasciolaris*, *matutinus*) (resurrect sp., elevate subspp., allozymes, male color, merist & morph. diffs.) 813-823; *Eleutherodactylus iberia* n. sp. (compare to rels.) 852-859; *Ostraciidae* (phylogen. anal. of genera, reinterpret. of vert. fusions) 859-865; *Perulibatrachus kilburni* n. sp. (compare to congeners) 901-904; *Nannoptopoma* n. gen. (*spectabilis*, *sternoptychum* n. sp.) (key to spp., key to genera of tribe) 904-912; *Gymnotus bahianus* n. sp. (evid. for monophyly of genus) 955-965;

Hylodes heyeri n. sp. (compare to congeners) 965-969; *Paracanthopterygii* (pediculate), *Gobiesocidae*, *Callionymoidae*, *Perciformes* (discuss. of synaps. at highest class. levels) 1022-1029.

TEMPERATURE, *Coluber constrictor* (daily body temp. rel. to activ.) 8-14; *Norops chrysoplepis scyphus* = *Anolis nitens scyphus*, *Norops chrysoplepis planiceps* = *Anolis nitens nitens* (body temp. above ambient) 56-68; *Alligator mississippiensis* (high temp. & low food prod. small body size) 212-216; *Crotalus lepidus* (body temp. in energy budget diffs. btwn. popns.) 319-329; *Varanus mertensi* (body temp., seas. var. in semiaquat. lizard) 354-362; *Sistrurus miliarius barbouri* (little eff. on activ., in subtropics) 389-401; *Pseudacris crucifer* (biochem. adapts. to freezing) 517-525; *Anolis gundlachi* (lack of therm. acclim. in met. rate) 535-542; *Merluccius* (*productus*, *gayi*, *hubbsi*), *Trachurus* (*s. symmetricus*, *s. murphyi*, *lathamii*), *Scomber japonicus* (temp. toler. in biogeogr. of antitropical marine fishes) 586-598; *Urosaurus ornatus* (temp.-sensitive pigment cells) 804-812.

TRUSS ANALYSIS, *Lepomis macrochirus* (signif. diff. btwn. habs. w/in popn.) 348-354; *Lythrurus* (*ardens*, *fasciolaris*, *matutinus*) (in sp. diagnosis) 813-823.

VISION, *Crotalus viridis oreganus* (import. in strike beh.) 419-428; *Micromyzon* n. gen. *akamai* n. sp. (eyeless) 641-648.

WATER BALANCE, *Coluber constrictor* (water flux rates in wild) 8-14; *Crotalus lepidus* (water flux in energy budget determ., diffs. btwn. popns.) 319-329; *Varanus mertensi* (water flux in semiaquat. lizard compar. to terrest. rels.) 354-362.

